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URBAN LAND

NEWS AND TRENDS IN CITY DEVELOPMENT

November, 1952

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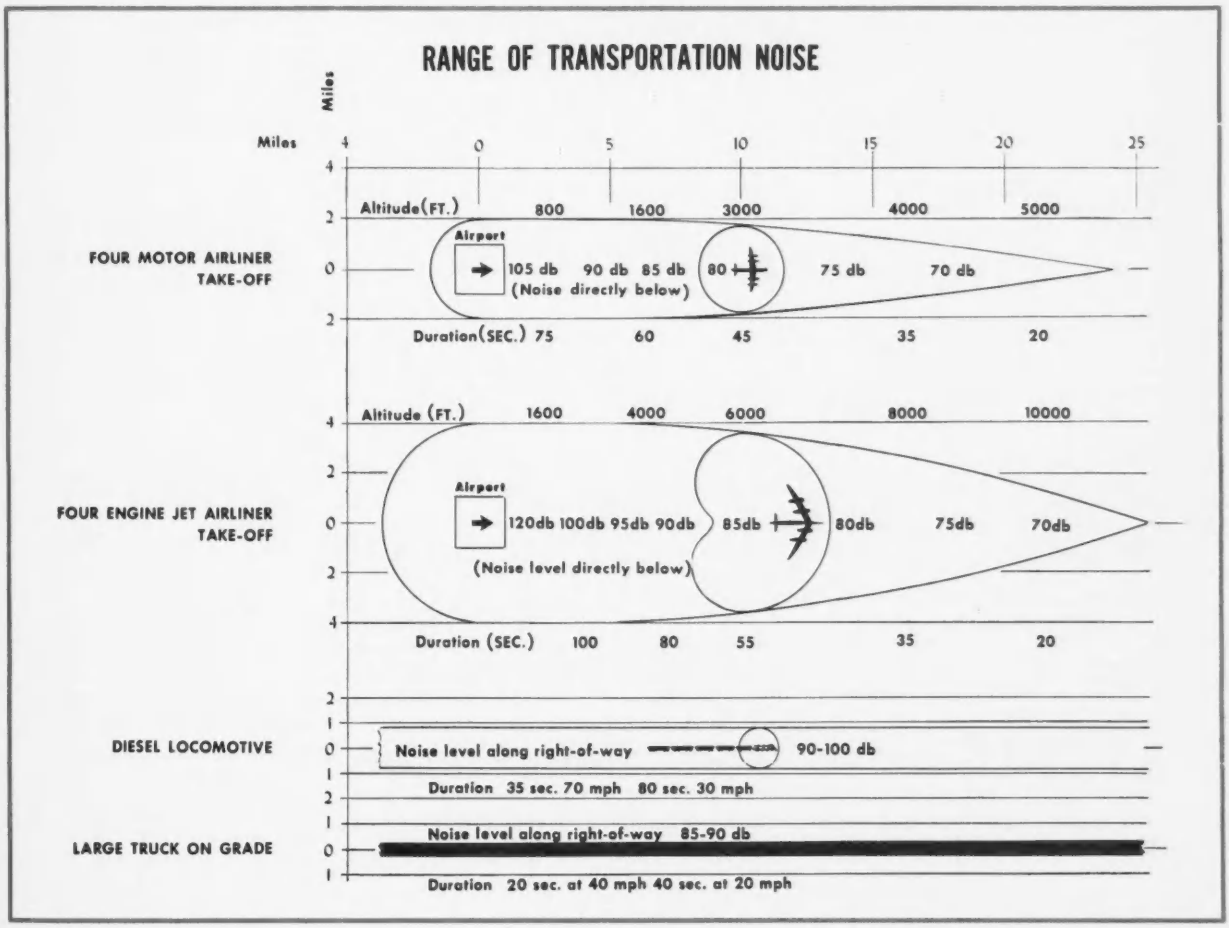
MEASURING NOISE IN OUR CITIES

By Dr. H. C. Hardy, Armour Research Foundation


RANGE OF TRANSPORTATION NOISE
Miles
Miles 4 0 5 10 15 20 25
FOUR MOTOR AIRLINER TAKE-OFF
Altitude(FT.) 800 1600 3000 4000 5000
Airport
105 db 90 db 85 db 80 75 db 70 db
(Noise directly below)
Duration(SEC.) 75 60 45 35 20
FOUR ENGINE JET AIRLINER TAKE-OFF
Altitude (FT.) 1600 4000 6000 8000 10000
Airport
120db 100db 95db 90db 85db 80db 75db 70db
(Noise level directly below)
Duration (SEC.) 100 80 55 35 20
DIESEL LOCOMOTIVE
Noise level along right-of-way 90-100 db
Duration 35 sec. 70 mph 80 sec. 30 mph
LARGE TRUCK ON GRADE
Noise level along right-of-way 85-90 db
Duration 20 sec. at 40 mph 40 sec. at 20 mph

Editor's Note

The Armour Research Foundation, affiliated with the Illinois Institute of Technology, was organized to perform research for industry. As a non-profit organization, much of its pure research is oriented to civic and public service activity. In this connection, the Foundation has conducted extensive research on the subject of noise within cities. From the Chicago Noise Survey, many of the present methods for measurement of noise levels within a city were developed. On the occasion of the meeting of the Executive Committee of the Community Builders' Council in Kansas City, Missouri, Dr. H. C. Hardy, Assistant Chairman, Physics Research Department, was asked to amplify the Armour Research Foundation's findings about noise in order to carry the effect of the growing disturbance from airplanes into the field of land development. Dr. Hardy's remarks are printed here for the benefit of all readers of URBAN LAND.

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Plan-itorial . . .

Practicalities Before Blueprints in Redevelopment

In bringing a redevelopment project to the stage where land is to be resold to new investors, there are many steps to climb. Following site determinations, an early deliberation is selection of the highest and best use for the area. After the appropriate reuse has been determined, there begins the slow process of negotiations with potential redevelopers. In this phase of the project, policies must be set for the reconstruction. In order to formulate the reuse plan, the investor's needs and requirements must be carefully considered in balance with the equally important municipal requisites. At this point in policy formulation, the ultimate rebuilding is made possible.

Policies Precede Pictures

The important intermediate stage between reuse selection and reuser negotiation is often passed over lightly. Because technicians are anxious to present a plan indicating the appearance of the new layout, they neglect full exploration of the practicalities of land appraisal, assemblage and reuse value. In redevelopment planning, it is essential to prepare carefully drafted outline specifications for the new use before proceeding with perspectives of the new structures.

Many elaborate brochures describe new plans for redevelopment project areas. Regardless of the merit of this visual aid to accomplishment, the picture makes for a fixed impression in the public mind that this is the way the authority intends for the area to be rebuilt. A prospective redeveloper becomes wary of rigid requirements. Rather, the agency charged with promotion of the project would advance the work faster were it first to produce a prospectus for the framework of the reuse plan including the policy on land disposition and reconstruction. Policies precede pictures. With policies determined, but without rigid commitment to a fixed scheme, the agency is in a flexible position to contract with redevelopment bidders.

A prospective redeveloper wants to be able to construct the new use in a way that allows for a degree of latitude in its special requirements. For an industry, the investor wants a site adaptable to special facilities entailed with the plant. In a residential redevelopment project, the builder wants flexibility in types that answer overlaid specifications such as density or rent levels.

Industrial Redevelopment

In the industrial redevelopment project particularly, it is undesirable for the sponsoring agency to blueprint the plan ahead of the negotiations. A specific industrial reuse may not be found readily. While negotiating, it would be better for the agency to designate the reuse as being within the general classification of the area's zoning. Central locations, where most industrial redevelopment projects are to be found at the moment, are marketable only when the projects can compete favorably with outlying areas in terms of tax valuation and land sale price. To these factors have to be added the qualification that the project be provided with ample site area for the plant and the parking plus adequate and direct accessibility from railway and highway. Furthermore, before the industrial reuse plan is set, the agency must clarify any conflict between advantages of the central city location and the Federal dispersal policies on industrial location.

As a case in point, we refer to "Zoned for Industry," the prospectus published for its industrial redevelopment project area by the Urban Redevelopment Section, Somerville Housing Authority, Somerville, Massachusetts. In our opinion, this agency is proceeding correctly toward the ultimate realization of an industrial redevelopment project. The prospectus describes policy and becomes a basis for negotiations with investors prior to any final plan commitments and before any development plan becomes fixed by delineation and by City Council approval. J.R.McK.

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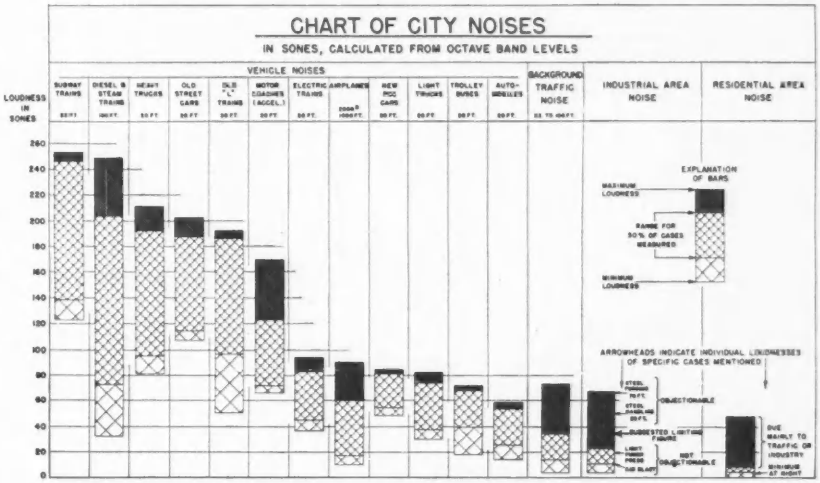
ROAD DAMAGE TESTS

Damage done to city streets by heavy trucks has always been suspected, but now there is direct evidence against the culprits. Conclusive tests for pavement cracking have been conducted. According to the AMERICAN MUNICIPAL NEWS, the Highway Research Board has proven the damage done by heavy loads from evidence as a result of extensive tests over a specially built roadway. Pavement cracking under a 22,400 pound load on a single axle was 6.4 times that caused by a lighter 18,000 pound load. Joints in slabs were markedly depressed. Cracks appeared at 50% of slab joints under the heavier load and at 18% of the joints in the other test lane. Tests of tandem-axle loads were dramatic. The 44,800 pound tandem-axle load caused 12.3 times as much cracking as the 32,000 pound load. In the lane carrying the 44,800 pound load, 96% of the slabs were cracked due to structural failures and 93% of the joints were cracked; whereas in the lane under the lighter 32,000 pound load, only 27% of the slabs cracked and 18% of the joints failed to hold. It is reported that tests were so carefully controlled that the general conclusions cannot be disputed. So it would seem that city officials should take aggressive action to enforce reasonable truck weight limits on city streets.

MEASURING NOISE IN OUR CITIES

By Dr. H. C. Hardy, Armour Research Foundation

In evaluating noise levels and noise conditions, there has to be a standard, or system, for numerically describing the "loudness" of a noise. The decibel, or sound level, is the measure for the intensity of a noise. But to measure only intensity does not correlate sound with loudness. It is necessary to measure the amount of sound energy in various frequencies in order to get the effect of sound on the human ear. If a sound is low in pitch, it is not as annoying as is a high pitched sound. The sound level inside an airplane is higher than the sound level inside a subway train as measured by the sound level meter. But the airplane ride is not nearly as annoying on the ear because the subway sound contains a lot of high frequencies while the airplane's noise has all low frequencies.



The loudness in sones of various city noises was evaluated from the measured levels.

Loudness

Frequency of sound is measured in cycles per second. Sound level is measured in decibels—40, 50, 60, etc. A normal conversation measures about 65 or 70 decibels. To complete the correlation between sound levels and frequencies, there are units of loudness. The unit of loudness is called the "sone."

The sone is an arithmetical unit that tells how loud something is. One sone is about the loudness of the hum of your kitchen refrigerator. Conversation is about 10 or 15 sones, a typewriter about 25 sones. A subway ride rises to about 100 sones. Loudness in some factories goes up to 1,000 sones.

City Noises

From the chart made from the investigation that went into the findings from the extensive Chicago Noise Survey, we can tell what are the noisiest things in the city. (See Chart of City Noises on this page). In looking at the chart, we find that moving vehicles make the most noise—subway trains, diesel and steam trains, heavy trucks, old street cars, old elevated trains, motor coaches accelerating after a stop. Airplanes are low on the scale—about even with street cars, when the plane is up about 1,000 feet. But all these noises are too high.

There are lots of noises in the American city which are much higher than they should be. The three worst noise problems in American cities are the truck, the locomotive and the airplane. The chart puts the airplane problem in the proper perspective.

The Airplane

An airplane taking off from a two-mile square airport (four square miles is the average size of an airport in the United States) climbs at about a three-degree angle. The rate of climb isn't very great as the plane travels from zero to five, ten, fifteen, twenty, and twenty-five miles in distance. (See frontispiece.) The rate of climb brings the plane to 800 feet in altitude at two miles from the runway, 3,000 feet at ten miles away, 5,000 feet at twenty miles distance; and from then on, it climbs to its cruising altitude. The width for the area covered by noise is two miles from each side of the flight path—about a total of four miles wide—and the band tapers off as the plane gets to high altitude. Another reason for the noise spread tapering off is that the engines are not run at full power when the airplane reaches its cruising altitude. The point at which noise tapers off is a little indefinite, depending on the operation of the airplane. Directly below the plane when it's two miles away from the airport, the noise level is about 105 decibels. This is pretty loud; one cannot talk in the presence of it. At the distance of ten miles, the noise level is 80 decibels, which is still above talking level. Of course, the sound doesn't stop when it hits the plotted two-mile distance from the center line of the path of travel, but spreads out and drops rapidly with distance. Within the area indicated, the level would still have adverse effect on conversation and would be annoying at night. Incidentally, the chart measures the largest propeller plane typical of most airliners As a matter of fact, if and when larger propeller planes are made, they probably will not make much more noise than shown on the chart unless the supersonic propeller, which goes faster than the speed of sound, is put into use.

The Jet Plane

The second set of noise levels shown on the chart is the four-engine jet airliner, operating at take-off from the same airport. Jets are not quite as bad as they have been labeled, but they are much worse than the propeller planes. The distance for which the noise would be unacceptable would be about four miles each side of the airport runway path. Thus, the band covered by noise is approximately twice that of the other plane. The rate of climb is unpredictable, but it is probable that the jet airliner will climb faster. To get efficiency out of jet engines, it is important to climb to as high an altitude as you can as fast as possible. So from an operational standpoint, jet airliners will probably climb faster than propeller planes. I have used a

rate of climb twice that of the propeller type. At that rate, the noise will cover a wider area. The noise level directly below the plane will be higher until it gets out ten miles. At these noise levels, the noise will be intolerable at a couple of miles from the airport. If a jet were flying every minute, people would find that any site within four miles from the path of flight would not be a desirable place in which to live.

I have plotted the length of time the sound lasts. Of course, the sound comes in slowly. It comes up to a peak and then drops off again as the airplane goes by. The range plot for the four-engine airliner is a circle which is the circle of listening. A jet plane doesn't make a circle of noise; it puts out more noise behind the plane than ahead of it and the pattern is something like the heart shape shown on the chart.

The noise pattern, at the rate of speed the propeller plane would normally have, lasts 75 seconds at two miles distance from the end of the runway. Of course, there is a peak in the middle of the 75 seconds as the plane flies directly overhead. But the sound comes in slowly, then lasts a total of 75 seconds at two miles distance, 45 seconds at ten miles away and 20 seconds at twenty miles from the airport.

For the jet plane, it would be 100 seconds at five miles from the take-off, 55 seconds at ten miles, and so on. So there is quite an appreciable time in the duration of sound. With a plane taking off every minute, you have a continuous noise; one burst will come and before it dies out, another will be coming. I might say that one plane per minute is not at all unpredictable because that many planes take off and land every minute in Chicago right now. So, in the future, large cities will have at least that magnitude of traffic.

The Diesel Locomotive

I have plotted on the chart also the noise level covered by diesel locomotives and large trucks on grade to see what area is covered by these noises. The area covered by a diesel locomotive along the right-of-way is about $^2/_3$ mile on each side of the track. The sound level at this distance is about 65 decibels—about the level where people start complaining. There may be much more area covered by the diesel train than by the airplane because its noise spreads out continuously along the entire length of the right-of-way. People living in the adjoining acres along that right-of-way may be subjected to greater noise than the airplane flying directly overhead a few miles away from the airport. For these people, the noise problem from the diesel locomotive is worse than from the airplane. The duration is about 35 seconds for a train speed of 70 miles an hour, and 80 seconds for 30 miles an hour.

The Motor Truck

The last transportation noise analyzed on the chart is a large truck on an up-grade. I might say this is one of the most important problems for residential areas. If there is a grade on the road, more people are affected by virtue of the truck noise than by any other. However, the distance across which the noise spreads is not very great. The range for a truck climbing any grade is about 500 feet on each side of the right-of-way. The noise levels may be—right at the street—higher than the airplane noise level. So, to people living right on the right-of-way, the truck noise is worse than the airplane noise. The noise level for the truck is 85 to 90 decibels, and it may be quite frequent too, as there is one right after the other rolling up the grade. The duration is about 20 seconds at a truck speed of 40 miles per hour and 40 seconds at 20 miles per hour. The rolling noise of a truck isn't nearly as bad as the acceleration of the motor.

Quieting Airplanes

The next problem is the possible future for quieting airplanes. I might say that trucks and diesel locomotives could be quieted if someone provided the needed muffler space or put up the price of buying such equipment, but airplanes are different. Airplane studies have been made by the National Advisory Committee for Aeronautics. The chief thing that makes noise in a propeller plane is the propeller itself and the main offender is the turbulence due to the tip speed of the propeller. N.A.C.A. has proposed propeller quieting by using a higher number of blades —six or eight blades—or a larger diameter blade, 15 feet instead of 13 feet. This means that the tip speed could be less. This change would quiet the plane considerably and would reduce its area of noise coverage to practically half the present range. However, this change would also bring exhaust noise into the picture. Airplane mufflers have been made that are not too heavy. Before these changes could be brought about, however, every airplane would have to be redesigned from scratch. The weight added to the airplane by adding bigger propellers would be about a thousand to two thousand pounds per airplane. The weight distribution would all be changed. The airplanes in use now would have to be remodeled. The industry asks, "Who's going to pay for this?" Because of the knowledge gained in making the present propeller, the industry doesn't feel like starting all over to re-design on the basis of a new kind of propeller However, the aircraft people are very conscious that there is this noise problem and there is a trend towards noise reduction. As to the jet engine, I think nobody knows whether it can be quieted or not. Fundamentally, the magnitude of the noise reduction problem makes one shudder. The English are more cognizant of this than we because they have already started commercial jet work, but are afraid that it will be unacceptable to the public, and they are, therefore, doing research on exhaust configurations. I might say also that military jet engines will make much more noise than that shown on the chart. The position and placement of military airports is very much more of a problem than are civic airports.

Airport Locations, Jets and Supersonic Speeds

I am sometimes asked, "What about supersonic jets?" In supersonic speeds there is a pressure wave behind the plane. To the ear this pressure wave sounds like the crack of a bullet. The military are cognizant of the noise problem and have their public relations sections under instructions to handle carefully the civilian complaints. But insofar as there being an adverse effect from plane noises on the health or physical welfare, there is none.

In Alexandria, Virginia an ordinance exists requiring planes approaching and departing from the Washington National Airport to fly at least 1,000 feet above the community. Because there are many restricted sectors in the area, Alexandria is left as the only clear flight zone. Sometimes planes cannot climb fast enough to rise above the thousand foot ceiling. Pilot violators are charged with a $300 fine. This presents quite a problem for the pilots, as the fault lies not with them, but with the airport location.

Insofar as airport locations can be recommended generally, it would seem better to have the fields close to the cities. For example, the Kansas City airport is located between the two noisiest areas of the two cities. This is good, particularly as the path of flight is over the railroad tracks and the industrial districts. In Chicago, the flight path might be over the drainage

canal where the affected area is already industrialized. Between the post office and the suburbs, the helicopters are now required to fly this path. The helicopters are not usually heard because they fly over places which are already noisy. One of the solutions to the noise problem is to bring the noise to the noise.

The moving of an airport to great distances is not necessarily a solution of the noise problem. The differential between the level of sound in the background and the aircraft noise is greater farther out—besides, there is always some residential area out thirty miles from the city.

The Doolittle report (see July-August, 1952, *Urban Land Plan-itorial*) mentioned airport location and plans for runways. The location for the new airport at Chicago was condemned by this report. The pattern of runways with a contemplated design of radial runways was scathed because planes could then approach from every direction allowing for no limitation over the spread of flight noise. Instead, a pattern of parallel runways running in one direction only was recommended.

In the New York area, the airplane noise problem is very much under discussion. Before the recent crash landing accidents, the noise had not been given attention. But with the concern over accidents, attention was focused on the noise problem and there has been agitation for a remedy.

As a result of the hazard factor, the F.H.A. and V.A. are objecting to residential development within the flight pattern of the airport approach and take-off zones. The F.H.A. is concerned with market values of residential areas within this zone. As a matter of fact, it is foolish to build a house within two miles of the airport runway flight pattern. The nuisance factor on property values corresponds in a rough way to a location close to an elevated train track.

In connection with jet engines, particularly the quieting of test facilities, the Armour Research Foundation has conducted a vast amount of research. An enormous amount of concrete absorption material is required for each test cell. One problem was to find a site where a jet engine plant could be placed so that the enormous cost for sound reduction could be minimized. A railroad is required to bring in the engines and the gasoline. It was found that the best location was not in the wilds, but right in an industrial area where there already was noise. In this location, the noise level did not have to be reduced to such a great extent.

As yet, there is no certainty that the jet engine will come into use for commercial aircraft. A jet engine is more expensive to run than is a propeller plane. The gas turbine engine used with the propeller may be a more likely development. In this case, the noise factor would be intermediate between the jet engine and the propeller engine.

Other Clues to Control of Sound

The question has been asked if there is anything a property owner can do about city noise. It should be remembered that the ear is not sensitive to small changes of magnitude. A twenty per cent change is about the least change which is perceived. A sound that increases to 10 decibels is actually increased by ten times in energy. About half as loud is 8 decibels, so that a very large change is necessary to get appreciable results. If there are two sounds, the ear will hear only the excess of one over the other. It is exactly like striking a match in a lighted room —the match light is unnoticed, but in a dark room, the match flame by contrast is very bright. In an office, a typewriter noise is seemingly lessened if a steady sound, such as a ventilator fan, exists. The noise level is not lowered, only its relationship to the background is reduced.

There is a famous Connecticut case: A property owner along the Merritt Parkway was plagued by the continuous zoom and swish caused by passing cars, particularly at night. A solution came when a fountain was installed on his property. The tinkling splash from the fountain masked the traffic sound.

An indoor noise is quite different from an outdoor noise because of limitations on the path of travel. Inside, a noise bounces from the reflecting surfaces. When there is acoustical absorption, energy is removed from the sound and it becomes softened. Outdoors, the sound travels in one direction from the source; there is little bouncing around. Outdoor sound can be reduced only by energy absorption. Shrubbery and grass will account for only a little absorption. One of the few solutions is to build a wall high enough to deflect the sound and to prevent penetration. At a distance, because of the angle, the wall has to be high enough to stop the sound's path of travel. The height required makes the wall impractical as a solution.

An earthen bank parallel to a railroad track can help in screening train noise. In Chicago, the Illinois Central, as it runs along the lakefront, is provided with a wall along the side toward the city. On top of the wall there is planting. In the parks, except for an occasional train whistle, the noise of the railroad cannot be heard against the high level of other traffic noises in the immediate area.

The question has been asked whether noise is a health menace. It is not. Noise is a nuisance and an invasion of privacy. Depending on an individual's personality, noise can make some persons nervous and irritable, but the noise is not a health menace.

Oftentimes a complaint against a noise is not a complaint arising from the noise, but from an invasion of privacy. If a quiet truck passes along a residential street, it goes unnoticed. But if it should be a noisy truck, complaints will arise. A factory close to residences may give rise to all sorts of complaints. But the factory may make no noise; it is the invasion of their privacy against which the residents are complaining. If that invasion is strong, it affects real estate values. People will not buy within that area, which gives rise to an even stronger complaint against the noise.

Often a noise problem is solved by doing nothing about the noise except taking it out of sight. The method of of treatment is a case of "out of sight, out of mind."

TRENDS IN OFF-STREET PARKING LEGISLATION

Public Enemy Number One is not a gangster; it is the parking problem. But just as laws do not prevent crime, so legislation for parking does not acquire spaces. There must be a program of action. Nevertheless, adequate parking enabling legislation must be available before a municipality can start tackling a solution to the problem.

The legal tools with which the way to a solution can be opened are examined in the latest bulletin on Off-Street Parking published by the Highway Research Board of the National Research Council. In this type of legislation, the Board's investigation finds six major trends. One is the increasing reliance placed upon revenue bonds for financing off-street facilities. A second significant development is the emergence of the concept of an integrated system of facilities including both curb and off-street accommodations. Tied-in with this is the increasing dedication of net curb parking meter revenues for purchasing off-street facilities. Another tendency being observed is the permission to establish supplementary, income-producing, commercial enterprises in connection with parking projects. There is also an increasing willingness to authorize the use of eminent

domain for the acquisition of property for off-street facilities. Finally, there has been a remarkable development toward the creation of special parking agencies. The second part of the investigation reported on in the bulletin is an appraisal of the public parking agency.

The important aspect of the existing parking legislation reported on in this bulletin is that any municipality in the United States desiring to alleviate its parking difficulties can now turn to a vast body of laws dealing with off-street automobile parking for a guide in formulating an act that would best serve its own particular needs. The Bulletin is Number 48, published by the Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C., 60¢. David R. Levin, Chief of Land Studies Section, Bureau of Public Roads, is the author.

In Print

A Primer on Rehabilitation Under Local Law Enforcement. Committee on Rehabilitation, National Association of Real Estate Boards, Washington, D. C. 1952. 68 pp. illus.

"An understanding of American economic habits requires an understanding of economic waste." This is the blunt but correct introductory statement in the primer on rehabilitation recently released by the National Association of Real Estate Boards. Contending that the wasteful practice of neglecting the old areas of our cities must stop, the report advocates urban conservation and the arrest of erosion in urban values.

The subject of the report is threefold: Stopping waste in our older urban areas through conservation and rehabilitation measures; guiding cities and real estate boards in developing local programs in urban conservation; and summarizing the progress in urban rehabilitation in cities throughout the country where rehabilitation programs are under way. An appendix contains sample ordinances and forms to guide the establishment of an effective rehabilitation program.

Planning Goals, Monograph No. 2, Santa Clara County Planning Commission, Court House, San Jose 13, Calif. 1952. 16 pp. mimeo. $1.00.

Here is a County that knows where it is going. In this booklet the Planning Commission lets it be known the direction that its plans will take. By setting down its goals, the Commission gives the citizen positive assurance that plans will lead toward achievement of a well-rounded life for the community. This statement of purpose is a guarantee of positiveness in the local planning that is too often missing. This purposefulness indicates that this Commission has dedicated itself to its function. The document itself is simple but praiseworthy.

Local Planning and Zoning. State of New York Department of Commerce, 112 State Street, Albany 7, N. Y. 1951. 85 pp.

An explanation of the powers, duties and procedures of official planning and zoning bodies is frequently desired by individuals or organizations wanting to establish such means for development of their community. This brochure of the New York Department of Commerce would serve as a useful reference. The explanatory sections apply to official planning and zoning generally. The appendices give New York statutes for local planning and zoning. The brochure thus becomes a manual for planning on powers and procedures for both citizens and governmental officials.

Quality and Treatment of Water in the West. Ray W. Hawksley. Reprinted from *Western Industry*, King Publications, San Francisco 5, Calif. June 1952. 21 pp. 50¢.

Characteristics of water supply as well as availability is an increasingly important factor in the selection of an industrial plant site. This fact is stressed more and more in literature about industrial processes and about plant location. The five articles from *Western Industry* reprinted in this booklet give technical facts about treatment of water for industrial use that indicate how vital a consideration water can be in industrial plant location. There is also included a tabulation of analyses of water supplies in the principal cities and towns in the eleven Western States.

You and Your Planning Commission. City Planning Commission, Oakland, Calif. illus. 16 pp.

When people have an understanding, they generally can appreciate the why's and wherefore's. So it is with city planning. One way to get the needed support for planning is to inform the public about what the commission does. For this reason we think this pamphlet, recently published by the Oakland, California Planning Commission, is excellent. This is a primer about the Commission and its job. The text is simple and the line drawings are clear illustrations. The pamphlet is recommended as an example of a brochure that sells a planing commission to the local people.

Rezoning Chicago. City Council of Chicago Committee on Buildings and Zoning. 1952. 16 pp. illus.

America's second largest city is preparing a new zoning ordinance. As a preliminary, the Committee has addressed this report to the citizens. The brochure describes the unified organization created to prepare the actual ordinance. But what is more, in this report, the Committee tells the people of the size of the job which is being undertaken and speaks of its importance to the general welfare. This explanation becomes a briefing for what is being done and an introduction to a later appeal for public understanding. By this kind of information, Chicago should be able to hold intelligent public hearings backed by neighborhood support. This report is not emotional; it is factual.

New Industrial Location in the New York Metropolitan Region, 1946 through 1950, Regional Plan Bulletin No. 80. Regional Plan Association, Inc., 205 East 42nd Street, New York 17, N. Y. August 1952. 8 pp. maps, illus. $2.00.

Trends in industrial location must be studied for the ramifications bearing on residential areas, retail trade activities and community facilities. In this new bulletin, the Regional Plan Association reports on its study of the location of the 2,658 new plants built in the New York metropolitan region in the five-year post-war period, 1946-50. In this period, industrial construction was not under any dictates of the national dispersal policy, hence the results are a clue to what happens under free choice in selection of location. The highlight of the report is the fact that many kinds of industrial activities are seeking and finding suburban locations where once, only residential development had been anticipated. The information in this bulletin should be of general interest throughout the country, as well as useful to those in the New York region concerned about location of homes, services, community facilities and transportation means.

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